

Appl. No. 10/034,699
Amdt. Dated 04/06/2004
Reply to Office Action of 02/06/2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-2. (cancelled)

3. (currently amended) The composition of claim ~~2~~ 4 wherein a mole fraction of equivalents of silicone hydrogen bond (Si-H) provided by the hydrogen terminated silicone oil to a total equivalents of Si-H provided by both the silicone crosslinker and the hydrogen terminated silicon oil is at least 0.4.

4. (currently amended) ~~The A~~ composition of ~~claim 2~~ comprising:
at least one vinyl-terminated silicone oil;
at least one conductive filler;
at least one hydrogen terminated silicone oil; and
at least one silicone crosslinker to form a gel thermal interface material with low modulus, wherein the silicone crosslinker is a random co-polymer comprising at least three silicone-hydrogen bonds (Si-H), the composition being a curable and thermally conductive material.

5. (currently amended) The composition of claim ~~1~~ 4 wherein a molar ratio of Si-H equivalents to Si-vinyl equivalents is in a range of approximately 2 to 0.6.

6. (original) The composition of claim 5 wherein the ratio is approximately 1.

7. (currently amended) The composition of claim ~~1~~ 4 wherein the conductive filler is one of aluminum, silver, copper, aluminum nitride, aluminum oxide, zinc oxide, boron nitride, aluminum nitride, silver coated copper, silver coated aluminum, and carbon fibers, and alloys and mixture thereof.

8. (currently amended) The composition of claim ~~1~~ 4 wherein the conductive filler has a particle size of less than 300 microns.

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9. (cancelled)

10. (currently amended) ~~The A composition of claim 9 further comprising: at least one coupling agent for the filler.~~

at least one vinyl-terminated silicone oil;

at least one conductive filler;

at least one hydrogen terminated silicone oil;

at least one catalyst for curing reaction; and

at least one coupling agent for the filler, the composition being a curable and thermally conductive material.

11. (currently amended) ~~The A composition of claim 9 further comprising:~~

at least one vinyl-terminated silicone oil;

at least one conductive filler;

at least one hydrogen terminated silicone oil;

at least one catalyst for curing reaction; and

at least one adhesion promoter, the composition being a curable and thermally conductive material.

12-13. (cancelled)

14. (currently amended) The method of claim 13 ~~15~~ wherein a mole fraction of equivalents of silicone hydrogen bond (Si-H) provided by the hydrogen terminated silicone oil to a total equivalents of Si-H provided by both the silicone crosslinker and the hydrogen terminated silicon oil is at least 0.4.

15. (currently amended) ~~The A method of claim 13 comprising:~~

combining at least one vinyl-terminated silicone oil, at least one conductive filler, and at

least one hydrogen terminated silicone oil to form a curable thermal interface material (TIM);
and

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combining a silicone crosslinker to form a gel thermal interface material with low modulus, wherein the silicone crosslinker is a random co-polymer comprising at least three silicone-hydrogen bonds (Si-H).

16. (currently amended) The method of claim ~~12~~ 15 wherein a molar ratio of equivalents silicone-hydrogen bonds (Si-H) to equivalents of silicon-vinyl bonds (Si-vinyl) is in a range of approximately 2 to 0.6.

17. (currently amended) The method of claim ~~12~~ 15 wherein the ratio is approximately 1.0.

18. (currently amended) The method of claim ~~12~~ 15 wherein the conductive filler is one of aluminum, silver, copper, aluminum nitride, aluminum oxide, zinc oxide, boron nitride, aluminum nitride, silver coated copper, silver coated aluminum, carbon fibers, alloys and mixtures thereof.

19. (currently amended) The method of claim ~~12~~ 15 further comprising combining at least one catalyst for curing reaction.

20. (original) The method of claim 19 further comprising combining at least one coupling agent for the filler.

21. (original) The method of claim 19 further comprising combining at least one adhesion promoter.

22. (cancelled)

23. (currently amended) The processor assembly of claim ~~22~~ 28 further comprising:
a substrate coupled to the semiconductor device; and
an interposer coupled to the substrate.

24. (original) The processor assembly of claim 23 further comprising:

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a first plurality of solder bumps coupling the substrate to the semiconductor device; and
a second plurality of solder bumps coupling the semiconductor device to the substrate.

25. (original) The processor assembly of claim 23 further comprising:
a plurality of pins extending outwardly from the interposer.

26. (cancelled)

27. (currently amended) The processor assembly of claim 26 28 wherein a mole fraction of equivalents of silicone hydrogen bond (Si-H) provided by the hydrogen terminated silicone oil to a total equivalents of Si-H provided by both the silicone crosslinker and the hydrogen terminated silicone oil is at least 0.4.

28. (currently amended) ~~The~~ A processor assembly ~~of claim 26~~ comprising:
a semiconductor device;
a heat spreader coupled to the semiconductor device;
a first curable thermal material between the semiconductor device and the heat spreader
to provide thermal resistance, the first curable thermal material comprising:
at least one vinyl-terminated silicone oil,
at least one conductive filler, and
at least one hydrogen terminated silicone oil,
a thermal element coupled to the heat spreader; and
a second curable thermal material between the heat spreader and the thermal element, the
second curable thermal material comprising:
at least one vinyl-terminated silicone oil,
at least one conductive filler, and
at least one hydrogen terminated silicone oil,
the first and second curable material further comprises at least one silicone crosslinker to
form a gel thermal interface with low modulus, wherein the silicone crosslinker is a random co-
polymer comprising at least three silicone-hydrogen bonds (Si-H).

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29. (currently amended) The processor assembly of claim ~~22~~ 28 wherein a molar ratio of Si-H equivalents to Si-vinyl equivalents is in a range of approximately 2 to 0.6.

30. (currently amended) The processor assembly of claim ~~22~~ 28 further comprising:
a substrate coupled to the semiconductor device; and
a plurality of pins extending outwardly from the substrate.